



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/791,203	03/02/2004	Jun Xin		1985

22199 7590 08/10/2007
MITSUBISHI ELECTRIC RESEARCH LABORATORIES, INC.
201 BROADWAY
8TH FLOOR
CAMBRIDGE, MA 02139

EXAMINER

KRASNIC, BERNARD

ART UNIT PAPER NUMBER

2624

MAIL DATE DELIVERY MODE

08/10/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/791,203	Applicant(s) XIN ET AL.	
	Examiner Bernard Krasnic	Art Unit 2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213:

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>3-02-2004</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

1. Claims 9 and 14 are objected to because of the following informalities:

Claims 9 and 14, line 3 respectively: "the absolute value" should be -- an absolute value --.

Claim 14, line 4: "the threshold" should be -- a threshold --.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 8-14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 8-9 and 14, lines 1-2 respectively: The limitations "the macroblock coding type" and "the macroblock motion type" lack clear antecedent basis.

Claim 9, lines 1-4: The limitation "the filtering is field-based when" the "macroblock are greater than a threshold" renders this claim indefinite and unclear because the Fig. 3 and paragraph [035] of the Applicants specification tend to read the opposite. The

Art Unit: 2624

Examiner has considered the claim language to be correct, and therefore Fig. 3 and the specification should be corrected to incorporate this claim language.

Claims 10-11 are dependent upon claim 9.

Claims 12 and 13, lines 1-2 respectively: The limitations "the macroblock coding type" and "the macroblock transform type" lack clear antecedent basis.

Claim 14, lines 1-4: The limitation "the filtering is frame-based when" the "macroblock are less than or equal to the threshold" renders this claim indefinite and unclear because the Fig. 3 and paragraph [035] of the Applicants specification tend to read the opposite. The Examiner has considered the claim language to be correct, and therefore Fig. 3 and the specification should be corrected to incorporate this claim language.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 2624

5. Claims 1-8, 12-13, and 15-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Simsic et al (US 6,269,484 B1, disclosed by Applicants Information Disclosure Statement) in view of Callway et al (US 6,680,752 B1, disclosed by Applicants Information Disclosure Statement).

Re Claim 1: Simsic discloses a method for processing a compressed input video / deinterlacing compressed video streams, comprising decoding / decoder (107) the compressed input video / compressed video stream (102) to produce an interlaced picture / decoded picture data (116), and macroblock coding information / macroblock mode data and decoded motion vector data (112, 114) of the input video, the interlaced picture having a first spatial resolution / frame consisting of two fields, and a top-field / top odd field and a bottom-field / bottom even field; and filtering adaptively / deinterlacer adaptive filtering the top-field / odd field and the bottom-field / even field of the interlaced picture according to the macroblock coding information to produce a progressive picture / deinterlaced progressive image for progressive display (see Figs. 1, 3, and 4, col. 1, lines 20-22 and 42-67, col. 2, col. 3, lines 14-26, col. 4, lines 33-37, col. 6, lines 43-67, col. 7, lines 1-28, col. 9, lines 59-67, col. 10, lines 1-11, abstract).

However, Simsic fails to specifically suggest producing a progressive picture with a second spatial resolution less than the first spatial resolution.

Callway discloses to produce a progressive picture with a second spatial resolution less than the first spatial resolution (see Fig. 1, col. 2, lines 9-15 and 22-28, col. 5, lines 66-67, col. 6, lines 1-19, downscalers 114 and 116 are used after the

Art Unit: 2624

deinterlacer but as part of the filtering process to produce a lower spatial resolution progressive image).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Simsic's method using Callway's teachings by incorporating the downscaling filtering, which produces lower resolution progressive pictures, after Simsic's deinterlacer in order to display the progressive output on a low resolution display (this motivation rationale is known in the art, see Mohsenian et al US 2003/0081144 A1, paragraph [0005]).

Re Claim 2: Simsic further discloses the macroblock coding information includes a macroblock coding type / intracoded [I-frame] and non-intracoded [B-frame, P-frame] and a macroblock transform type / IDCT affected macroblock (see col. 2, lines 23-33, col. 7, lines 53-56, col. 8, lines 61-62, the affect of the IDCT on a macroblock indicates a DCT type transform was used).

Re Claim 3: Simsic further discloses the macroblock coding type includes intra-coding / intracoding [I-frame] and inter-coding / non-intracoding [B-frame, P-frame] (see col. 2, lines 23-33, col. 7, lines 53-56).

Re Claim 4: Simsic further discloses the macroblock transform type includes a frame-based transform and a field-based transform (see col. 6, lines 23-27, col. 5, lines 33-37, col. 2, col. 8, lines 61-67, when the affect of the IDCT on a macroblock indicates a DCT

Art Unit: 2624

type transform, then the macroblock is indicated as having motion which field filtering is used to fix, if no indication of DCT type transform, then the macroblock is indicated as having no motion which frame filtering is used to fix).

Re Claim 5: Simsic further discloses the macroblock coding information further includes a macroblock motion type / motion vector data and corresponding motion vector when the macroblock coding type is inter-coding (see col. 4, lines 33-37, col. 6, lines 43-67, col. 7, lines 1-28).

Re Claim 6: Simsic further discloses the macroblock motion type includes frame-based and field-based (see Fig. 6, 158 tells if the motion type is either field or frame based).

Re Claim 7: Simsic further discloses the filtering includes frame-based filtering / "weaver" method and field-based filtering / "bob" method (see col. 2, col. 5, lines 33-37).

Re Claim 8: Simsic further discloses the filtering is field-based / "bob" (motion) when the macroblock coding type is inter-coding / non-intracoding and the macroblock motion type is field-based / field based motion (see col. 8, lines 37-48, the "1" indicates using the "bob" method).

Re Claim 12: Simsic further discloses the filtering is field-based / "bob" (motion) when the macroblock coding type is intra-coding and the macroblock transform type is field-

Art Unit: 2624

based (see col. 8, lines 39-67, col. 9, lines 16-20, when the affect of the IDCT on a macroblock indicates a DCT type transform, then the macroblock is indicated as having motion which field filtering is used to fix).

Although Simsic discloses this field-based transform and filtering for a non intracoded macroblock, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have this for an intracoded macroblock as well in order to better adaptively filter the intracoded macroblocks.

Re Claim 13: Simsic further discloses the filtering is frame-based / "weave" (no motion) when the macroblock coding type is intra-coding and the macroblock transform type is frame-based (see col. 6, lines 23-27, col. 5, lines 33-37, col. 2, col. 8, lines 39-67, when the affect of the IDCT on a macroblock indicates a DCT type transform, then the macroblock is indicated as having motion which field filtering is used to fix, if no indication of DCT type transform, then the macroblock is indicated as having no motion which frame filtering is used to fix).

Although Simsic discloses this frame-based transform and filtering for a non intracoded macroblock, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have this for an intracoded macroblock as well in order to better adaptively filter the intracoded macroblocks.

Re Claim 15: Simsic further discloses the filtering is frame-based / "weave" method and operates on input samples from the top-field / odd field and bottom-field / even field of

Art Unit: 2624

the interlaced picture (see col. 1, lines 20-22 and 42-67, col. 2, col. 3, lines 14-26, col. 4, lines 33-37, col. 6, lines 43-67, col. 7, lines 1-28, col. 9, lines 59-67, col. 10, lines 1-11, abstract).

Re Claim 16: Simsic further discloses the filtering is field-based / "bob" method and operates on input samples from the top-field or bottom-field / even fields (see col. 1, lines 20-22 and 42-67, col. 2, col. 3, lines 14-26, col. 4, lines 33-37, col. 6, lines 43-67, col. 7, lines 1-28, col. 9, lines 59-67, col. 10, lines 1-11, abstract).

Re Claim 17: Simsic further discloses the filtering is field-based / "bob" method and operates on input samples from the bottom-field / even fields (see col. 1, lines 20-22 and 42-67, col. 2, col. 3, lines 14-26, col. 4, lines 33-37, col. 6, lines 43-67, col. 7, lines 1-28, col. 9, lines 59-67, col. 10, lines 1-11, abstract).

Re Claim 18: Simsic further discloses encoding the progressive picture to an output video (see col. 3, lines 15-25, for the progressive video to be outputted to the display device, some type of encoding occurs for the device to be able to read the output video).

Re Claim 19: Simsic further discloses rendering the progressive picture on a display device (see col. 3, lines 15-25).

As to claim 20, the claim is the corresponding system claim to claim 1 respectively. The discussions are addressed with regard to claim 1.

The limitations, as recited in claim 20, "means for decoding" in line 2 and "means for filtering" in line 6 invoke 35 USC 112, 6th paragraph.

6. Claims 9-11 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Simsic as modified by Callway, and further in view of Yeh et al (US 2004/0233329 A1). The teachings of Simsic as modified by Callway have been discussed above.

Re Claim 9 [as best understood by the Examiner]: Simsic further discloses the filtering is field-based / "bob" method (motion) when the macroblock coding type is inter-coding / non-intracoded, the macroblock motion type is frame-based / motion type frame, and the motion vectors corresponding to the macroblock are greater than a threshold (see Fig. 6, col. 1, lines 20-22 and 42-67, col. 2, col. 3, lines 14-26, col. 4, lines 33-37, col. 6, lines 43-67, col. 7, lines 1-28, col. 9, lines 59-67, col. 10, lines 1-11, abstract, Ref. No. 166 checks if the frame based inter-coded motion vectors are greater than a threshold and if they are "1" makes the filtering field based or "bob").

However, Simsic as modified by Callway fail to specifically disclose that the filtering is field based when the absolute value of motion vectors corresponding to the macroblock are greater than a threshold [although motion vectors are always positive (therefore there really isn't a need for the absolute value of them) another reference Yeh is used to disclose this feature].

Yeh discloses filtering is field-based / "bob" when the absolute value of motion vectors corresponding to the macroblock are greater than a threshold (see Fig. 1, paragraph [0017], lines 13-21, apply the "bob" filter if the absolute value of the motion vectors is larger than the threshold).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to further modify Simsic, as modified by Callway, using Yeh's teachings by incorporating this absolute function in order to further improve the adaptive filtering (see Yeh, abstract, paragraph [0012]).

Re Claim 10: Yeh further discloses the threshold equals zero (see paragraph [0021], line 5).

Re Claim 11: Yeh further discloses the threshold is greater than zero (see paragraph [0020], line 28).

Re Claim 14 [as best understood by the Examiner]: Simsic further discloses the filtering is frame-based / "weaver" (no motion) when the macroblock coding type is inter-coding / non-intracoding and the macroblock motion type is frame-based / motion type frame, and the absolute value of motion vectors corresponding to the macroblock are less than or equal to the threshold (see Fig. 6, col. 1, lines 20-22 and 42-67, col. 2, col. 3, lines 14-26, col. 4, lines 33-37, col. 6, lines 43-67, col. 7, lines 1-28, col. 9, lines 59-67, col. 10, lines 1-11, abstract, Ref. No. 166 checks if the frame based inter-coded motion

vectors are greater than a threshold and if not they are "0" makes the filtering field based or "weaver").

However, Simsic as modified by Callway fail to specifically disclose that the filtering is frame based when the absolute value of motion vectors corresponding to the macroblock are less than or equal to the threshold [although motion vectors are always positive (therefore there really isn't a need for the absolute value of them) another reference Yeh is used to disclose this feature].

Yeh discloses filtering is frame-based / "weaver" when the absolute value of motion vectors corresponding to the macroblock are less than or equal to the threshold (see Fig. 1, paragraph [0017], lines 13-21, apply the "weaver" filter if the absolute value of the motion vectors is not larger than the threshold).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to further modify Simsic, as modified by Callway, using Yeh's teachings by incorporating this absolute function in order to further improve the adaptive filtering (see Yeh, abstract, paragraph [0012]).

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Chung et al discloses a method for coding digital interlaced moving video; Alvarez discloses apparatus and methods for down-conversion video de-interlacing; Xin discloses a method and system for processing compressed input video.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bernard Krasnic whose telephone number is (571) 270-1357. The examiner can normally be reached on Mon-Thur 8:00am-4:00pm and every other Friday 8:00am-3:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jingge Wu can be reached on (571) 272-7429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Bernard Krasnic
August 8, 2007



JINGGE WU
SUPERVISORY PATENT EXAMINER